Partners in the New Economy

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UMass and the People of the Commonwealth

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UMass Lowell

Christine Gebski
Genzyme Corporation
Cambridge

Ron Homer
Boston Bank of Commerce
Boston

UMass Boston

UMass Amherst

Sophia Zervas
UMass
Class of 1994

UMass Medical Center, Worcester

Haim Gunner
EcoScience Corporation
Worcester

Devin McManus
Falmouth Medical Associates
Falmouth

Fred Satkin
Satkin Mills
New Bedford

Cary Crossman
Danaher Corporation
Springfield

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A Report from the President's Office
University of Massachusetts

Partners in the New Economy

Fellow Citizens of Massachusetts:

Each of us has felt the impact of economic change since the late 1980s. We all know from personal experience, or from that of our families and friends, the human toll of a downsizing or a plant closing. This toll is all the greater because of the fundamental restructuring of the economy we are now experiencing.

As the Commonwealth's public university, the University of Massachusetts exists to serve you. We are committed to becoming the most responsive and responsible public university in the nation. With the support of the Governor and the Legislature, we are one of the state's strategic assets for economic development.

Our primary responsibility is to give you the educational and economic tools you need for the future. This mission is part of our heritage as a land grant university, chartered in 1863 to educate the sons and daughters of the Commonwealth and to support the state's economy in "agriculture and mechanical arts." Now, we stand ready to be your partner in the new, knowledge-based Massachusetts economy.

To help the people of Massachusetts meet the future with confidence, UMass has established three strategic initiatives. The first is to reaffirm the importance of teaching and learning. The new economy calls for lifelong learning to acquire new skills and information, and it requires the intellectual resilience necessary to live with constant change. This is the kind of education people need to get and keep jobs.

Economic change has a social dimension in our pluralistic society. The new economy needs the efforts of all its citizens, so its success depends upon people who can work together in a spirit of respect for difference. Thus, our second initiative is to embrace diversity and capitalize on its strengths.

Our third initiative is to promote economic development. UMass must invest its intellectual capital in Massachusetts by sharing the ideas and discoveries that foster innovation and generate jobs.

These three initiatives are absolutely intertwined. To succeed in the new economy, we must devote ourselves to teaching and learning, to living productively in a diverse society, and to helping create new businesses and jobs.

This report will show you some of the ways UMass is helping individuals and organizations all across the state deal with economic change. Because the economy impacts each of us personally, in the following pages you'll meet seven of our partners in the new economy. Sophia Zervas, Devin McManus, and Chris Gebski are just starting out, at early stages of their educations or careers. Fred Satkin, Ron Homer, Cary Crossman, and Haim Gunner are established business leaders, each representing a different industry, but all committed to a healthy economic future for our state. UMass is proud to support each of them in her or his pursuits. And we want their stories to stand for the many ways in which the University of Massachusetts can help you and your families live productive and meaningful lives in the new economy. For us, that's the true measure of success in economic development.

Sincerely,

Michael K. Hooker
President

Sophia Zervas

UMass, Class of 1994

"It's when you reinforce material from your coursework in a research lab situation that you really learn. You acquire lab skills, but what's more important is discovering how to analyze your data, how to ask, 'What can I do next?' The training you get here at Amherst in that inquisitive process is so helpful in whatever you decide to do, whether it's grad school or med school or going out into the real world and getting a job. Knowing how to ask the questions is what matters."

Teaching undergraduates to ask important questions in the new economy

AS AN UNDERGRADUATE biochemistry major, Sophia Zervas of Everett is engaged in research that may eventually contribute to biodegradable plastic products and packaging. She works in a research lab on the Amherst campus alongside graduate students, post-doctoral fellows, and faculty members. It may be years before the questions she's asking about the effects of certain enzymes on natural polymers are fully answered, and longer still before those answers are translated into commercial products, but that doesn't deter Zervas. Understanding that her work is part of a long-term, multidisciplinary, international effort, she developed her research problem to complement work a post-doctoral fellow is pursuing, and she is leaving questions behind for the undergraduates who follow her.

Significant primary research experience is matter-of-course for undergraduates in the natural sciences at UMass Amherst. This level of involvement is not limited to graduate students, as it is at many universities. UMass encourages all qualified undergraduates to delve into questions that can lead to published papers and presentations at professional conferences. Dean of Natural Sciences and Mathematics Linda Slakey points out that the teaching labs connected with coursework are necessarily somewhat artificial, without too many surprises. In contrast, research labs present students with real life scientific situations, teaching them complex methodology, teamwork, and ways to deal with the inevitable frustrations of primary inquiry.

Experience of this quality enables graduating seniors to step right into jobs in industrial laboratories. In fact, Dean Slakey says, students in the life sciences at UMass Amherst are in high demand among the Commonwealth's biotechnology and biomedical companies. (Genzyme Corporation alone snapped up three 1993 graduates.) Very often, undergraduates who go directly into these industries later earn graduate degrees in management, ensuring a strong scientific foundation for the industry's future leadership. The students who continue on to graduate school for doctorates in science fare equally well, entering the most competitive programs in the country. As for Sophia Zervas, she's heading to medical school – at UMass Medical Center.

UMASS SETS THE PACE IN ENGINEERING EDUCATION

Thanks to a recent National Science Foundation grant and new partnerships with industry, beginning in fall 1994, engineering education at UMass will emphasize:

- Integration of manufacturing and design across the curriculum
- Hands-on learning that is project-oriented and team-based
- Increased access for women and minority students
- A practice-oriented master's degree to help defense engineers learn commercial manufacturing

Devin McManus, M.D.

Falmouth Medical
Associates
Falmouth

"Attending to the whole person is the basis of primary care – it's what you might call the art of medicine, and it's just as important as the science. That's the approach I learned at UMass Medical Center, and it helps me in my practice here on the Cape, where I see many elderly patients on fixed incomes. Deciding which drug to prescribe is sometimes more than a clinical choice; there can be an economic side, too. That's why I'm glad my training emphasized listening to patients and including them in decisions."

Educating the next generation of primary care doctors for the Commonwealth

DEVIN MCMANUS speaks with the enthusiasm you'd expect from someone who's started his medical practice and had his first child within the last year. But he also worries – about his patients, the cost of health care, and the bureaucracy of health insurance. Since joining Falmouth Medical Associates, a six-person practice affiliated with Falmouth Hospital, McManus has handled the full spectrum of adult medicine, and he experiences both the excitement and the frustrations of primary care.

In the din of the national health-care debate, all sides agree that primary care physicians – generalists in internal medicine, family medicine, and pediatrics – give patients the most comprehensive and cost-effective care. Yet only 29% of U.S. doctors practice primary care. In a nationwide effort to attract more physicians to this field, the U.S. medical establishment is playing catch-up to UMass Medical Center. Chancellor and Dean Aaron Lazare, M.D., points out that over 50% of the class of 1993 chose primary care residencies. And they are likely to stay there: 40% of the class of 1989 is still in primary care, ranking UMass first among New England medical schools and fourth in the nation.

Worcester native Devin McManus and his wife, Anandi Mehta, M.D., fit the UMass profile. After completing both medical school and residency at UMass Medical Center, the couple looked around for an underserved area of Massachusetts in which to practice and found it on the Cape. Their choice was based in part on the UMass learning contract, a tuition-remission agreement that encourages graduates to establish their practices in the Commonwealth. By practicing primary medicine in an underserved area, McManus and Mehta represent the future of the learning contract, which has been modified to support the economic as well as the physical health of Massachusetts citizens. Beginning with the class of 1995, participating graduates who choose to pay back the deferred tuition with service must practice in primary care, in public or community service, or in geographically underserved areas of the state for two years following residency. This change will improve access to medical care as well as increase the return on public investment in the learning contract.

UMASS PHYSICIANS SERVE MASSACHUSETTS

UMass Medical Center is currently a finalist for a six-year, $2.5 million award from the Robert Wood Johnson Foundation, aimed at increasing the number of students and residents pursuing generalist careers. At present:

- 51% of all graduates practice in-state
- 45% of the graduates practicing in-state are in primary care
- All areas are served, from the Cape to the Berkshires, in every county except Nantucket, and UMass is working on that one!

Christine Gebski

Genzyme Corporation
Cambridge

"With a bachelor's degree, I began to plateau, and I realized I wanted more of a challenge in my career. At the same time, I needed a cost-effective, part-time program, and UMass Lowell was the best choice for me. The program really helped me think differently. The wider your window of knowledge is, the better you are at your specific job. Now I'm able to step back and look at the big picture. If Genzyme said, 'Chris, we'd like you to work on this project,' whatever it was, I'd feel equipped."

Retraining professionals to advance in biotechnology

IF YOU'VE been tested for "bad" cholesterol recently, chances are you've benefitted from Chris Gebski's work. At Genzyme Corporation in Cambridge, she's part of the development team for a new diagnostic test measuring LDL cholesterol, on the market since its approval by the U.S. Food & Drug Administration in 1993. A senior research associate at Genzyme, this Haverhill resident earned a graduate certificate in biotechnology and bioprocessing at the Lowell campus while on her way to a master's degree.

Chris Gebski emphasizes how important the certificate program was to her career development. With an undergraduate degree in biology, she had solid laboratory experience, but it was oriented to hospital- and university-based research, not to industry. "When I graduated, I basically didn't know what biotech was," she admits. At UMass Lowell, Gebski built on the on-the-job training she gained at Genzyme by concentrating on bioprocessing, the development of methods for manufacturing products for market.

Massachusetts is currently home to nearly 150 biotechnology companies – second only to California. But the state is in danger of losing its leadership position in biotechnology research unless it can manufacture biotechnology products competitively. The UMass Lowell certificate program is aimed at this critical issue. Recognizing that undergraduate education does not prepare anyone adequately for bioprocessing, it gives scientists like Chris Gebski experience in the engineering approach to problem solving and offers engineers the chance to apply biological principles. Chemical engineer Carl Lawton, director of the program, makes sure students learn an efficient, results-oriented approach consistent with an industrial laboratory environment, focusing on such bioprocessing concerns as scale-up for commercial production and the economic implications of various alternatives.

Thanks to the major defense conversion grant the University was instrumental in bringing to the Commonwealth in 1993, qualified scientists and engineers among the 46,000 defense workers who will lose jobs in Massachusetts by 1997 are now eligible for retraining for mid- to senior-level positions in bioengineering. Defense conversion funds are bootstrapping the Massachusetts Bioengineering Center, a joint program of the University of Massachusetts Lowell, Worcester Polytechnic Institute, and the Massachusetts Biotechnology Research Institute to make the retraining available.

UMASS SUPPORTS WORKERS IN TRANSITION

Through the Donahue Institute, UMass is a leading provider of services to displaced workers around the state at sites including:

- Berkshire Worker Assistance Center and Berkshire Enterprises (Pittsfield)
- Central Massachusetts Entrepreneurial Program (Marlboro)
- Ft. Devens Re-Employment Assistance Center
- GE-Wang High Technology Center (Wilmington)
- Holyoke Worker Assistance Center
- Martin Marietta Employment Transition Center (Pittsfield)

Fred Satkin

Satkin Mills
New Bedford

"I'm always looking for ways to get ideas from the lab to the marketplace faster. That's what we need in the textile industry, where there's a huge market eager for new technology. There's a great return on investment, so why not capitalize on it now? Innovative ideas can move more quickly through the University than through most companies, particularly in an R&D environment like the Advanced Technology Center at UMass Dartmouth. So much expertise is available, from engineering to chemistry to patent law."

Putting new ideas on the fast track to market through UMass/industry partnerships

TODAY, Satkin Mills' core product is acetate linings for men's suits, but Fred Satkin is always looking ahead. With research and development help from the Advanced Technology Center (ATC) at UMass Dartmouth, he's been experimenting with a new wool-blend suiting fabric that he will be able to sell for far less than the Italian import now dominating the market. Diverting 80% of the mill's waste stream into recycling, Fred Satkin and his son Victor have developed innovative new products. The ATC has been instrumental in the development of fireplace logs made from discarded thread cones the mill had been paying $10,000 annually to cart to landfills. The Satkins also wanted to find a use for catchcord, the ends of acetate fiber left from the weaving process. ATC testing found this fiber to be an ideal filtering medium for salt-water aquariums, so Satkin Mills now converts its catchcord into a nonwoven fabric for filters and is working with the University to investigate possible medical applications.

The interdisciplinary Advanced Technology Center brings together expertise in business and textiles manufacturing and engineering for the benefit of students and industry throughout the region. Under the direction of Dartmouth Chancellor Peter Cressy, a fundraising campaign is under way for a building to house the ATC and a regional conference center. UMass and the ATC provide a neutral ground where industry representatives meet and communicate – in fact, Fred Satkin believes, the Massachusetts Textile and Apparel Council (MassTAC) would not have come together without the University.

Finding common ground is particularly important in the textile industry, a value-added chain from weaving to apparel finishing, where the success of every manufacturer in the region is interdependent. Now Fred Satkin is applying the textile industry's lessons of interdependence in a broader arena. As chairman of New Bedford's community redevelopment initiative, Satkin, with the University's help, is working to link improvements in manufacturing, transportation, aquaculture, retailing, and tourism to boost the entire regional economy of southeastern Massachusetts.

UMASS SUPPORTS REGIONAL DEVELOPMENT

Other UMass regional economic development partnerships include:

- UMass Amherst – Enterprise Development Initiative with the Pioneer Valley Economic Council
- UMass Boston – partnership with the Environmental Business Council
- UMass Lowell – Industrial Innovation Initiative for the Merrimack Valley
- UMass Medical Center – partnership with the Massachusetts Biotechnology Research Park

Ron Homer

Boston Bank of
Commerce
Boston

"Make no mistake about it, there's money passing through the inner city. If that income recycles in the community, it contributes to economic health. When people can access essential goods and services – groceries or gas or insurance – in their own neighborhoods, then the money they spend goes back into the community. In order to build that local economic base, developers and lenders and policy-makers need to understand the inner city, its strengths as well as its pathologies. That's why the research coming out of the Trotter Institute is so valuable."

Giving Bay State decision-makers the data they need for critical economic choices

BANKER Ron Homer understands the inner city. As chairman and CEO of the Commonwealth's only full-service commercial bank owned and operated by African Americans, he is committed to stimulating economic development in the inner city by supporting home ownership, quality rental housing, small business, and non-profit organizations. One of the most difficult aspects of creating reinvestment in distressed areas, Homer feels, is the lack of concrete information to guide decision-makers in government, business, and philanthropy. But he is quick to note how UMass Boston's William Monroe Trotter Institute is filling that information gap. Homer speaks from experience – he has relied on Trotter Institute data and analysis since the 1980s, during the planning for redevelopment along Boston's Southwest Corridor.

No ivory tower organization, the Trotter Institute addresses the needs and concerns of the black community of Massachusetts through research, technical assistance, and public service. Director James Jennings believes in introducing new issues to the public agenda, as he did in the fall of 1993, when the institute released a study of minority-owned businesses in Massachusetts. Minority business is hampered, the study found, by systematic barriers to capital formation and credit. This finding raised public consciousness by generating significant media attention, including an editorial in *The Boston Globe*. As the study pointed out, minorities will make up more than 30% of the Massachusetts population within less than 20 years, and unless these communities of color prosper, neither will the state as a whole.

The Trotter Institute is among the UMass resources available to serve the Commonwealth in a proposed system-wide research initiative known as the UMass Economic Project. The Project would give public and private policy-makers ongoing access to the information and analysis they need about the Massachusetts economy, coordinating resources and services according to the capacities of each campus. Each campus would take the lead on certain aspects of the Project's program, as UMass Boston and the Trotter Institute have already done on minority business issues.

UMASS ECONOMIC PROJECT TO OFFER UNIQUE RESOURCES

The UMass Economic Project would tap such UMass resources as Trotter and:

- Center for Economic Development (Amherst)
- Center for Industrial Competitiveness (Lowell)
- Center for Policy Analysis (Dartmouth)
- Donahue Institute
- Gaston Institute (Boston)
- Massachusetts Institute for Social and Economic Research (Amherst)
- McCormack Institute (Boston)

Haim Gunner, Ph.D.

EcoScience Corporation
Worcester

"I never set out to be an entrepreneur. Even now, I view myself as a research worker and teacher. But I like to see practical results from my work, and pursuing the kind of scientific research I wanted to do required a larger, production-oriented arena to support it. That's how EcoScience began, with help from the UMass Amherst School of Management and Small Business Development Center. EcoScience is now a fully articulated company employing 150 people, but it's also the actualization of a scientific ideal."

Converting UMass research into new businesses and jobs

IN 1981, Haim Gunner first contemplated starting a business based on his research on the biological control of cockroaches. In 1993, the Bio-Path Cockroach Control Chamber went on the market. During the 12 intervening years, the UMass Amherst microbiologist learned about business as he founded EcoScience Corporation and saw it through several infusions of venture capital, four patents, two public stock offerings, and two corporate acquisitions. As chairman and chief scientist, he looks back with a smile, conceding, "I had naive notions of what it takes to go from the research bench to the supermarket or hardware store. But I've proved that an academic spinoff doesn't necessarily have to sacrifice the teaching and research functions of its practitioners. That's a model I think the University can use."

EcoScience Corporation is a "green" company whose mission is to develop and commercialize safe and effective natural products to control pests, improve food quality, and enhance the integrity of the environment. Its Bio-Path product is the first natural cockroach control device to be registered by the U.S. Environmental Protection Agency (EPA) for use in sensitive environments such as homes, schools, and restaurants. Following successful field trials, the company is now preparing EPA submissions for products to control disease in fruits after they are harvested. These solutions to problems of insects and food quality are eco-sensitive, depending on a broad understanding of how the target interacts with its environment.

EcoScience, headquartered in Worcester with additional facilities in Amherst, Northborough, and Shrewsbury, earned revenues of $5.9 million in fiscal 1993. In 1994, *Inc.* magazine named EcoScience one of the fastest-growing public companies in the U.S. – ranking it 50th in the nation.

Gunner credits the University as the primary agent in his business launch, and he would like to see it take a more activist role in future spinoffs. He envisions an actual incubator facility where faculty could begin the commercialization process outside their academic labs. Gunner would also like to see the University invest in start-ups, providing not only a capital resource but a force for social values within new companies. In return, the University would reap financial benefits when the companies go public. "After all," he muses, "with shrinking resources for public education, we have to be our own saviors."

UMASS PROMOTES ENTREPRENEURSHIP

UMass Amherst faculty spin-off companies exert significant economic impact on the Pioneer Valley. Examples include:

- Amerinex Artificial Intelligence of Amherst (more than 20 employees, with plans to hire 30 more in the next year)
- Market Street Research of Northampton (5 full-time employees and approximately 30 part-timers)
- Millitech Corporation of South Deerfield (approximately 150 employees)
- National Evaluation Systems of Amherst (more than 100 full-time employees and approximately 200 part-timers)

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The University of Massachusetts is ready to serve the citizens of Massachusetts in the new economy. For more information, please contact any of the individuals listed below at The President's Office or the UMass campus in your area.

The President's Office, Boston
Tom Chmura
Vice President for Economic Development
Lynn Griesemer
Associate Vice President
617-287-7000

UMass Amherst
Jaymie Chernoff
Director of Economic Development
413-545-4516

UMass Boston
Ed Toomey
Executive Assistant to the Chancellor
617-287-6800

UMass Dartmouth
Ron McNeil
Dean, College of Business and Industry
508-999-8432

UMass Lowell
Fred Sperounis
Vice Chancellor for University Relations
508-934-2202

UMass Medical Center, Worcester
Joseph McGuirl
Director of Technology Transfer
508-856-5050

The President's Office • University of Massachusetts • 18 Tremont Street, Suite 800 • Boston, MA 02108 • 617-287-7000 • 617-287-7044 fax